

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:
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Date of mailing
(day/month/year)

28 APR 2005

Applicant's or agent's file reference

FOR FURTHER ACTION

See paragraph 2 below

DRE-0166

International application No.

International filing date (day/month/year)

Priority date (day/month/year)

PCT/US04/37076

04 November 2004 (04.11.2004)

04 November 2003 (04.11.2003)

International Patent Classification (IPC) or both national classification and IPC

IPC(7): D06M 11/73 and US Cl.: 8/ 128.1, 127.5, 115.7; 423/447.2; 428/367

Applicant

DREXEL UNIVERSITY

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

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TS

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US04/37076

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐ a sequence listing

☐ table(s) related to the sequence listing

b. format of material

☐ in written format

☐ in computer readable form

c. time of filing/furnishing

☐ contained in international application as filed.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US04/37076

Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>2</u>	YES
	Claims <u>1, 3-5</u>	NO
Inventive step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-5</u>	NO
Industrial applicability (IA)	Claims <u>1-5</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and explanations:

Claims 1 and 3-5 lack novelty under PCT Article 33(2) as being anticipated by Goldstein (US 6,126,888).

Goldstein teaches that a fiber yarn may be prepared by mixing organic fibers such as rayon, silk, and KEVLAR with carbon nanotubes to form a composite yarn or fiber. Claims 3-5 merely recite known uses of silk fibers and the intended use of the composite fiber is not seen to limit the fiber itself.

Claims 1-5 lack an inventive step under PCT Article 33(3) as being obvious over Glatkowski et al. (US 6,265,466 B1) in view of Senecal et al. (US 2001/0045547 A1).

Glatkowski et al. teach the formation of composite fibers containing polymeric materials including natural and synthetic polymers, as well as polymeric materials of plant, animal, or microbial origin. It would have been obvious to use silk, as it is seen to be a polymeric material of animal origin. Glatkowski teaches that the composites may be formed into fibers, which can be formed by conventional processing techniques. Senecal et al. teaches a process wherein composite fibers containing polymer materials and carbon nanotubes are formed by electrostatic spinning. It would have been obvious to use electrospinning, as taught by Senecal et al., in the process of Glatkowski et al. in order to process the composite into fibers. Claims 3-5 merely recite known uses of silk fibers and the intended use of the composite fiber is not seen to limit the fiber itself.

Claim 2 meets the criteria set out in PCT Article 33(2), because the prior art does not teach the electrospinning of fibers containing silk and carbon nanotubes.

Claims 1-5 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.